Applying knowledge to improve water quality

Pacific Northwest Regional Water Program

A Partnership of USDA NIFA & Land Grant Colleges and Universities

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Pharmaceuticals and Personal Care Products in Drinking Water

Over the past several years scientists have found many of the pharmaceuticals and personal care products (PPCPs) that we typically use in reservoirs that serve as our sources of drinking water. PPCPs refer to any products used by individuals for personal health or cosmetic reasons to enhance our health. Chemicals used by agribusiness to enhance the growth or health of livestock also fit into this category. So, PPCPs are a diverse collection of chemical substances that include:

- Prescriptions
- Over-the-counter therapeutic drugs
- Veterinary drugs
- Fragrances
- Lotions
- Cosmetics

People contribute PPCPs to the environment and more specifically water sources when:

- Medication residues pass out of the body and into sewer lines
- Externally-applied drugs and personal care products are washed down the drain, and
- Unused or expired medications are placed in the trash

It is very easy for small amounts of PPCP residues to get into our drinking water supplies. *To date the EPA has set not standards for any of these products in drinking water and there is no evidence that any of these products, when present in drinking water, pose a health threat to humans.* However, it is important that researchers study the potential short-term and long-term impacts of trace amounts of these compounds in our water supply to ensure the health of our citizens.

Despite the fact that there is no evidence to suggest that PPCPs at low levels in drinking water may be harmful to humans there is significant scientific concern about these materials in our water supplies. These concerns include:

- Pharmaceuticals are widespread in our nation's waters
- Research suggests that certain drugs do cause ecological harm to the environment – such as sex changes in aquatic organisms
- Large quantities of PPCPs can enter the environment after use by individuals or domestic animals
- The numbers and kinds of PPCP products available to consumers continues to increase
- Over 100 individual PPCPs have been identified in drinking water supplies
- Waste water plants are not equipped to remove PPCPs from sewage

On an annual basis over 270,000,000 tons of PPCPs are released into the waters of the USA. The vast majority of this discharge is legal and is done by individual homeowners washing or flushing PPCP residues down the drain. Consequently, PPCPs are found in the drinking water (at very low concentrations) of over 40,000,000 people. A study conducted by the United States Geological Survey (USGS) in 1998 found that 80 percent of surface waters sampled

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Pacific Northwest Regional Water Quality Coordination Project Partners

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Water Resource Research Institutes

Water and Environmental Research Center (Alaska)
http://www.uaf.edu/water/

Idaho Water Resources Research Institute
http://www.boise.uidaho.edu/

Institute for Water and Watersheds (Oregon)
http://water.oregonstate.edu/

State of Washington Water Research Center
http://www.swwrc.wsu.edu/

Environmental Protection Agency

EPA, Region 10
The Pacific Northwest
http://www.epa.gov/r10earth/

Office of Research and Development, Corvallis Laboratory
http://www.epa.gov/wed/

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The Project

Land Grant Universities, Water Research Institutes, and EPA Region 10 have formed a partnership to provide research and education to communities about protecting or restoring the quality of water resources. This partnership is being supported in part by the USDA's National Institute of Food and Agriculture (NIFA).

Our Goal and Approach

The goal of this Project is to provide leadership for water resources research, education, and outreach to help people, industry, and governments to prevent and solve current and emerging water quality and quantity problems. The approach to achieving this goal is for the Partners to develop a coordinated water quality effort based on, and strengthening, indivudual state programs.

Our Strengths

The Project promotes regional collaboration by acknowledging existing programs and successful efforts; assisting program gaps; identifying potential issues for cross-agency and private sector collaboration; and developing a clearinghouse of expertise and programs. In addition, the Project establishes or enhances partnerships with federal, state, and local environmental and water resource management agencies, such as by placing a University Liaison within the offices of EPA Region 10.

contained at least one PPCP. This includes the drinking water supply for the metro Portland, OR area where four different PPCPs have been measured at very low levels in the drinking water supply.

In the Pacific Northwest PPCPs are found in any water body influenced by raw or treated sewage. Consequently, we find PPCPs in rivers, streams, reservoirs, shallow groundwater, and coastal marine environments. Many of these waters provide drinking water to our region's citizens. In all probability, if you get your drinking water from a surface water source, you probably have trace amounts of PPCPs in your water. However, if your drinking water source is a moderately deep or a deep well (groundwater) you have much less risk of having PPCPs in your drinking water.

Because research has not shown PPCPs to be harmful at concentrations often found in drinking water supplies, the Environmental Protection Agency does not require public water supply systems to remove them from drinking water. However, homeowners that are concerned about PPCPs can purchase water filters containing activated carbon and attach them to their kitchen sinks to remove most if not all PPCPs.

You can help protect the environment by responsible disposal of unwanted PPCP products in your home. Never flush the unwanted portion of your PPCP down a toilet unless the label on your product specifically instructs you to do so. Instead, take advantage of local hazardous materials collection days. If collection is not available do the following:

1. Take the drug or product out of the container
2. Mix drug or product with an undesirable substance (cat litter, coffee grounds)
3. Put mixture into disposable unmarked container with a lid
4. Place sealed container in the trash

National Water Quality Program Areas

The four land grant universities in the Pacific Northwest have aligned our water resource Extension and research efforts with eight themes of the USDA's National Institute of Food and Agriculture.

1. Animal Waste Management
2. Drinking Water and Human Health
3. Environmental Restoration
4. Nutrient and Pesticide Management
5. Pollution Assessment and Prevention
6. Watershed Management
7. Water Conservation and Management
8. Water Policy and Economics

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